The role of endoscopy in the management of suspected small-bowel bleeding

Prepared by: ASGE STANDARDS OF PRACTICE COMMITTEE
Suryakanth R. Gurudu, MD, FASGE, David H. Bruining, MD, Ruben D. Acosta, MD, Mohamad A. Eloubeidi, MD, MHS, FASGE, Ashley L. Faulx, MD, FASGE, Mouen A. Khashab, MD, Shivangi Kothari, MD, Jenifer R. Lightdale, MD, MPH, FASGE, NASPghan representative, V. Raman Muthusamy, MD, FASGE, Julie Yang, MD, John M. DeWitt, MD, FASGE, Chair

This document was reviewed and approved by the Governing Board of the American Society for Gastrointestinal Endoscopy.

This is one of a series of statements discussing the use of GI endoscopy in common clinical situations. The Standards of Practice Committee of the American Society for Gastrointestinal Endoscopy (ASGE) prepared this text. In preparing this guideline, a search of the medical literature was conducted by using PubMed. Additional references were obtained from a search of Web of Science, SCOPUS, and the bibliographies of the identified articles and from recommendations of expert consultants. Guidelines for appropriate use of endoscopy are based on a critical review of the available data and expert consensus at the time the guidelines were drafted. Further controlled clinical studies may be needed to clarify aspects of this guideline. This guideline may be revised as necessary to account for changes in technology, new data, or other aspects of clinical practice. The recommendations are based on reviewed studies and are graded on the strength of the supporting evidence (Table 1). The strength of individual recommendations is based on both the aggregate evidence quality and an assessment of the anticipated benefits and harms. Weaker recommendations are indicated by phrases such as “we suggest,” whereas stronger recommendations are typically stated as “we recommend.”

This guideline is intended to be an educational device to provide information that may assist endoscopists in providing care to patients. This guideline is not a rule and should not be construed as establishing a legal standard of care or as encouraging, advocating, requiring, or discouraging any particular treatment. Clinical decisions in any particular case involve a complex analysis of the patient’s condition and available courses of action. Therefore, clinical considerations may lead an endoscopist to take a course of action that varies from these guidelines.

Obscure GI bleeding (OGIB) has been defined as overt or occult bleeding of unknown origin that persists or recurs after an initial negative bidirectional endoscopic evaluation including ileocolonoscopy and EGD. Overt OGIB refers to visible bleeding (eg, melena or hematochezia), whereas occult OGIB refers to cases of fecal occult blood positivity and/or unexplained iron deficiency anemia. Recent advances in small-bowel imaging, including video capsule endoscopy (VCE), angiography, and device-assisted enteroscopy (DAE), have made it possible to identify a small-bowel bleeding source and therefore manage the majority of patients who present with OGIB. As a result, a recent clinical guideline recommends a shift from the term obscure GI bleeding to small-bowel bleeding. The term OGIB would be reserved for patients in whom the sources of bleeding cannot be identified anywhere in the GI tract after completion of comprehensive evaluation of the entire GI tract, including the small bowel.

Of all the sources of GI bleeding, only a small percentage (5%) is attributed to small-bowel sources. Angiectasias of the small bowel account for 20% to 30% of small-bowel bleeding and are more commonly seen in older patients. Small-bowel tumors (eg, GI stromal tumors, carcinoid tumors, lymphomas, and adenocarcinomas) can present with small-bowel bleeding in both younger and older patients. Other benign etiologies include erosions and ulcers related to the use of nonsteroidal anti-inflammatory drugs (NSAIDs) and Crohn’s disease. Rare causes of small-bowel bleeding include Meckel’s diverticula–associated ulceration (especially in younger patients), radiation enteropathy, Dieulafoy’s lesions, small-bowel varices, and aortoenteric fistulas.

In patients with OGIB, upper and lower GI tract endoscopies often are repeated before small-bowel evaluation.
because substantial initial endoscopic miss rates have been reported.\textsuperscript{20,21} Techniques for evaluation of the small bowel include VCE, DAE, multiphase CT enterography (CTE), magnetic resonance enterography (MRE), and, in rare instances, intraoperative enteroscopy. These modalities can recognize small-bowel lesions and may impact therapeutic strategies, often preventing surgical interventions. Despite these advances, the most cost-effective approach to the management of patients with suspected small-bowel bleeding has not been fully determined. This guideline is an update of a prior ASGE document on the management of small-bowel bleeding.\textsuperscript{22}

### EVALUATION AND MANAGEMENT OF PATIENTS WITH SMALL-BOWEL BLEEDING

The evaluation and management of patients with small-bowel bleeding depends on clinical factors, such as the age of the patient, quality of the prior endoscopic evaluation, and the overt or occult status of the bleeding. Clinical signs, such as the nature of the bleeding (eg, melena vs hematochezia), can help direct the choice of endoscopic tests. In addition, local availability of procedures, patient preferences, physician expertise, risks, and costs are also important determinants of management.

Hemodynamic resuscitation is key to the management of all patients with GI bleeding.\textsuperscript{23} Moreover, patients on antithrombotic therapy should be managed according to recently published guidelines.\textsuperscript{24,25} A suggested algorithm for the management of suspected overt and occult small-bowel bleeding is shown in Figure 1.

#### Overt small-bowel bleeding

In patients with overt bleeding and a clinical presentation compatible with upper GI bleeding (eg, hematemesis), early EGD (within 24 hours) should be performed before small-bowel evaluation.\textsuperscript{25} If an upper endoscopy has been performed recently and was of sufficient quality, then a repeat upper examination could be performed with push enteroscopy to examine for proximal small-bowel lesions. If this does not reveal a source of bleeding, consideration should be given to repeat colonoscopy with evaluation of the terminal ileum.

For hemodynamically stable patients with overt bleeding, after upper and lower endoscopic examinations with normal results, VCE is recommended as the next diagnostic test. DAE can be considered in patients with positive bleeding sources identified on VCE. Multiphase CTE or MRE should be performed first if the patient has potential reasons for capsule retention.

For patients who present with hemodynamically significant bleeding, urgent angiography is recommended for embolization. A CT angiogram (CTA)\textsuperscript{30} or red blood cell (RBC) scan can be considered for localization of the bleeding source and to guide timing of the angiogram in hemodynamically stable patients. In patients with surgically altered anatomy in whom portions of the GI tract are bypassed (eg, Roux-en-Y gastrojejunostomy), DAE is the preferred endoscopic modality to assess the excluded luminal segment inaccessible to conventional and capsule endoscopic approaches.\textsuperscript{27,28} If these test results are negative, and bleeding recurs, technetium-99m pertechnetate scintigraphy (Meckel scan) can be considered in younger patients. Provocative testing with anticoagulants is rarely considered in patients with recurrent small-bowel bleeding, given safety concerns and limited benefit.\textsuperscript{29,31} Intraoperative enteroscopy during laparotomy or laparoscopy is typically used as a last resort in patients with recurrent small-bowel bleeding, such as those requiring multiple transfusions and/or repeated hospitalizations after unrevealing evaluation with VCE and DAE. Because of the high morbidity associated with intraoperative enteroscopy, it is reserved for rare cases in which DAE cannot be performed without lysis of adhesions.\textsuperscript{32}

#### Occult small-bowel bleeding

In patients with occult bleeding, repeat EGD should be considered when an upper GI lesion is suspected, such as in patients with risk factors for mucosal disease caused by NSAID use or if details of the prior EGD are uncertain. Repeat colonoscopy should be considered when the quality of the bowel preparation on the initial examination was suboptimal or when other questions about the quality of the examination exist. Additionally, when there is clinical suspicion for missed colon lesions, repeat colonoscopy may be performed.\textsuperscript{33}

### TABLE 1. GRADE system for rating the quality of evidence for guidelines\textsuperscript{1}

<table>
<thead>
<tr>
<th>Quality of evidence</th>
<th>Definition</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>High quality</td>
<td>Further research is very unlikely to change our confidence in the estimate of effect.</td>
<td></td>
</tr>
<tr>
<td>Moderate quality</td>
<td>Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.</td>
<td></td>
</tr>
<tr>
<td>Low quality</td>
<td>Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.</td>
<td></td>
</tr>
<tr>
<td>Very low quality</td>
<td>Any estimate of effect is very uncertain.</td>
<td></td>
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</tbody>
</table>

GRADE, Grading of Recommendations Assessment, Development and Evaluation. Adapted from Guyatt et al.
VCE is considered the first diagnostic step in the evaluation of small-bowel sources of occult bleeding once the upper GI tract and colon have been satisfactorily cleared as potential sources. A follow-up push enteroscopy or DAE is usually recommended for further management of positive results on VCE. Barium radiographic studies, such as small-bowel follow-through and enteroclysis, have low diagnostic yields and no longer have a role in the evaluation of these patients. Multiphase CTE may have a higher sensitivity compared with VCE when patients are being assessed for small-bowel neoplasms and should be performed first if stricture, bowel obstruction, or inflammatory bowel disease is suspected.\textsuperscript{34}

If VCE is performed, and a culprit lesion is found, appropriate endoscopic, angiographic, medical, or surgical intervention should be instituted. Several authors have suggested initial VCE followed by therapeutic DAE if the VCE result is positive as the best strategy for increased yield and improved treatment success.\textsuperscript{35-37} If the VCE result is negative, the patient’s clinical status should dictate the next step. Stable patients may be observed without further evaluation. For patients who need further work-up or who have recurrent bleeding, additional diagnostic modalities can be used. Patients who did not have a second-look endoscopy may benefit from repeat EGD and/or ileocolonoscopy. A repeat VCE also may be informative, particularly in patients whose presentations change from occult to overt bleeding or those with decreases in hemoglobin levels of $\geq 4$ g/dL.\textsuperscript{38}

**Role of second-look endoscopy**

Repeat EGD may yield a bleeding source even when the initial EGD is negative. For example, in studies of patients with suspected small-bowel bleeding that used small-bowel imaging technologies, suspected sources of bleeding were found within the reach of a standard EGD in 2.8% (4/140).\textsuperscript{39}

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*Figure 1. Suggested management approach to overt and occult small-bowel bleeding. Positive test results should direct specific therapy. Because diagnostic tests can be complementary, more than 1 test may be needed, and the first-line test may be based on institutional expertise and availability. PE, push enteroscopy; VCE, video capsule endoscopy; DAE, device-assisted enteroscopy; CTE, CT enterography; MRE, magnetic resonance enterography; RBC, red blood cell.*
and 4.7% (6/128) of patients during VCE, in 26% (25/95) of patients in studies that used push enteroscopy, and in 13.1% (14/107) of patients undergoing DAE. Factors associated with an increased yield of repeat EGD include large hiatal hernias, hematemesis, and a history of NSAID use. Patients with upper GI mucosal lesions also may have other contributing causes of iron deficiency anemia, such as malabsorption. Small-bowel biopsy to evaluate for underlying celiac disease should be considered in patients with iron-deficiency anemia. In patients with an unrecognized bleeding source, repeat ileocolonoscopy should be considered when clinical suspicion exists for missed colon lesions, although studies have reported variable yields using this strategy. For example, lower GI lesions were found in 0 of 50 patients undergoing repeat colonoscopy before VCE but in 10 of 35 patients (29%) undergoing retrograde balloon-assisted enteroscopy (BAE) 1 week after a colonoscopy with negative results. Miss rates for colon cancers have been attributed to several factors including incomplete procedures, poor bowel preparation, and female sex.

**Role of push enteroscopy**

The diagnostic yield of push enteroscopy for a bleeding source in the setting of suspected small-bowel bleeding is approximately 24% to 56%. In a study of 63 patients, after exclusion of all lesions proximal to the ligament of Treitz, the diagnostic yield for push enteroscopy was 41% in patients with recurrent overt small-bowel bleeding, 53% in those with persistent overt small-bowel bleeding, and 26% in those with occult small-bowel bleeding. Push enteroscopy allows not only for diagnosis and biopsy but also for therapeutic interventions, such as hemostasis. Decreased transfusion requirements and improvement in functional status 1 year after treatment have been demonstrated after push enteroscopy. In the appropriate clinical settings, push enteroscopy (instead of a repeat EGD) can be the next step when there is a high suspicion for an upper GI source or to treat the lesions that are found on VCE and deemed within the reach of push enteroscopy.

**Role of VCE**

VCE enables visualization of the entire small intestine in the majority of patients undergoing capsule endoscopy but lacks the potential for therapeutic intervention. A detailed description of VCE can be found in a separate ASGE Technology document. A meta-analysis of 14 prospective studies including 396 patients with small-bowel bleeding showed a higher yield for clinically significant lesions with VCE (56%) than with push enteroscopy (26%) or small-bowel follow-through (6%). A recent prospective multicenter study revealed an overall diagnostic yield of 67% for VCE in the evaluation of overt small-bowel bleeding. In this study, angiectasias were the most common sources (33%) of bleeding identified. Several other prospective studies also revealed very high sensitivity and specificity with VCE for detecting bleeding sources compared with other modalities such as intraoperative enteroscopy, CT angiography, and standard angiography. Given its high diagnostic yield, VCE is considered the test of choice in the evaluation of small-bowel bleeding after unrevealing standard endoscopic examinations. The diagnostic yield of VCE is higher if performed within 2 weeks (greatest yield in 48 to 72 hours) of an overt bleeding episode, and timing of capsule endoscopy can influence the diagnosis and outcomes in patients with small-bowel bleeding by identifying patients for early intervention. In addition, several other factors such as hemoglobin <10 g/dL, longer duration of bleeding (>6 months), presentation with overt bleeding, male sex, age >60 years, and inpatient status may identify patients with a greater chance of positive results on VCE.

If significant lesions are detected on VCE, the patient should be referred for specific management of these findings. VCE findings leading to endoscopic or surgical interventions or change in medical management have been reported in 37% to 87% of patients. Repeat bleeding rates after a VCE study with negative results are generally low (6%-11%). If the VCE study fails to identify the cause of small-bowel bleeding, a second VCE study may be considered, particularly at the time of repeat bleeding, although outcomes have been mixed. In a prospective study of 76 patients with persistent small-bowel bleeding and initial nondiagnostic VCE results, a second-look VCE showed positive results in 49% of patients. One small, prospective study of 20 patients with iron-deficiency anemia found that 35% of second VCE studies showed positive or suspected findings, and 10% resulted in a change in clinical management. Limitations of VCE include the inability to provide therapy or precisely locate a lesion, false-positive results, or potentially missed lesions. The primary risk of VCE is capsule retention, occurring in 1.4% of VCE examinations in 1 large study.

**Role of DAE**

DAE encompasses both BAE (ie, single-balloon system, double-balloon systems) and spiral enteroscopy. Total enteroscopy may be achieved through a combination of antegrade and retrograde approaches. A detailed discussion of the role of DAE (deep enteroscopy) in the management of small-bowel disorders can be found in a separate ASGE document.
(60% vs 57%, respectively; \( P = .42 \)) for all indications. However, a recent meta-analysis suggested a higher yield for DBE when it was performed after a VCE with a positive result as compared with a negative result (75% vs 27.5%; \( P = .02 \)).

Limited data are available in reference to the role of early DBE in the management of overt small-bowel bleeding. A recent study reported a high diagnostic and therapeutic yield (90%) with early (within 24 hours) DBE\(^\text{85} \) in 10 patients with overt small-bowel bleeding. Another retrospective study\(^\text{84} \) showed a higher diagnostic yield and lower incidence of recurrent bleeding with urgent DBE (within 72 hours after the last visible GI bleeding) compared with non-urgent DBE (diagnostic yield of 70% vs 30%; \( P < .05 \)) in 120 patients with obscure small-bowel bleeding. These studies suggest that early intervention with DBE may yield better outcomes.

Single-balloon enteroscopy and spiral enteroscopy also have been studied in patients with small-bowel bleeding. The diagnostic yield of single-balloon enteroscopy ranged from 58% to 74% in patients with suspected small-bowel disorders.\(^\text{85,86} \) A recent systematic review and meta-analysis suggested similar performance of single-balloon enteroscopy and DBE in terms of diagnostic and therapeutic yield.\(^\text{87} \) Initial series\(^\text{88} \) reported a low diagnostic yield with spiral enteroscopy (33%), but a more recent prospective study reported a higher yield (57%-62%) and improved outcomes in terms of transfusion requirements, iron supplementation, and additional therapeutic procedures with spiral enteroscopy in patients with small-bowel disorders.\(^\text{89} \)

A modeled cost-minimization analysis of the management of small-bowel bleeding proposed BAE as the most cost-effective initial test after standard endoscopy if the goal is treatment or definitive diagnosis, as opposed to visualization alone.\(^\text{90} \) Another model suggested that initial BAE was a cost-effective approach for patients with small-bowel bleeding who likely have angiectasias in the small bowel accessible with a single antegrade approach.\(^\text{91} \)

**Role of intraoperative enteroscopy**

Intraoperative enteroscopy during laparotomy or laparoscopy is typically considered as a last resort in the management of patients with obscure small-bowel bleeding requiring multiple transfusions and/or repeated hospitalizations.\(^\text{92} \) Endoscopic evaluation can be performed orally, rectally, and/or through enterotomies at the time of surgery. Diagnostic yields of intraoperative enteroscopy in small-bowel bleeding are reported to be between 58% and 88%.\(^\text{93-95} \) The role of intraoperative enteroscopy in coordination with VCE was evaluated in a study of 18 patients with small-bowel bleeding. In the 15 patients with lesions on VCE, intraoperative enteroscopy yielded treatment in 13 (87%), whereas in the 3 VCE studies with negative results, the intraoperative enteroscopy result was normal, suggesting an important directive role for VCE.\(^\text{96} \) Common adverse events associated with intraoperative enteroscopy include serosal tears, avulsion of mesenteric vessels, and prolonged ileus.\(^\text{97} \) Because of the high morbidity associated with intraoperative enteroscopy, its use is currently reserved for rare cases in which other modalities have failed to identify a lesion, or deep enteroscopy cannot be performed without lysis of adhesions.\(^\text{92} \)

**Role of radiographic studies of the small bowel**

Until recently, small-bowel follow-through was routinely used to screen the small intestine for a potential bleeding source. The yield of small-bowel follow-through in the evaluation of small-bowel bleeding is extremely low (3%-6%).\(^\text{55,98} \) In a small study, push enteroscopy demonstrated a superior diagnostic yield in the detection of small-bowel bleeding sources, compared with small-bowel follow-through.\(^\text{99} \) Enteroclysis allows for more detailed visualization of the small bowel, with particular utility in the detection of inflammatory bowel disease and neoplasms in patients with small-bowel bleeding.\(^\text{100} \) However, enteroclysis has not been shown to be useful in the detection of angiectasia, and it identified a bleeding source in only 8% of patients with negative push enteroscopy results.\(^\text{101,102} \) In patients with active bleeding, the use of contrast material may complicate subsequent evaluation with endoscopy or other radiologic imaging tests. Both small-bowel follow-through and enteroclysis should therefore be considered of limited value and no longer part of the routine evaluation of GI bleeding.

In contrast, multiphase CTE has emerged as a new modality for small-bowel investigation in patients with small-bowel bleeding. This technique uses large-volume neutral oral contrast material to distend the small intestine and enhance mural assessment. In addition, intravenous contrast material is administered, and images are typically acquired in the arterial phase (usually 30 seconds after the intravenous bolus), enteric phase (50 seconds after bolus), and delayed phase (90 seconds after bolus).\(^\text{103} \) This technique can detect inflammatory lesions, neoplasms, and vascular abnormalities including angiectasias, varices, and Dieulafoy’s lesions, aortoenteric fistulas, and pseudoaneurysms. Similar to VCE, multiphase CTE may aid the clinician by determining whether the antegrade or retrograde approach is more appropriate for DAE. In a comparison study of VCE and CTE in 17 patients with small-bowel tumors, CTE detected the lesion in 16 of 17 patients (94.1%), and VCE detected the lesion in only 6 of 17 patients (35.3%).\(^\text{34} \) These data suggest that multiphase CTE should be considered when a small-bowel neoplasm is suspected in the differential diagnosis, such as young patients with small-bowel bleeding. In a meta-analysis of 18 studies, Wang et al\(^\text{104} \) reported a pooled yield of 40% with CTE compared with 53% with VCE in patients with small-bowel bleeding. In a study of 52 patients...
with small-bowel bleeding and nondiagnostic VCE results, subsequent CTE revealed a 50% positive yield. In another study of 30 patients with negative CTE results, subsequent VCE revealed a 57% positive yield. These studies support the complementary role of CTE and VCE in the evaluation of patients with small-bowel bleeding. MRE is another imaging option that can be considered as an alternative to CTE in patients with suspected small-bowel bleeding. However, the data are limited regarding the role of MRE in suspected small-bowel bleeding. Multiphase CT or CTA refers to a technique that is similar to CTE but without oral contrast. A meta-analysis of 9 studies with 198 patients revealed a pooled diagnostic sensitivity of 89% and specificity of 85% with CTA in patients presenting with GI bleeding. CTA is widely available and can be performed rapidly for localization of the source of bleeding in patients presenting with acute GI bleeding.

Radioisotope bleeding scans may be helpful in cases of overt small-bowel bleeding if the bleeding rate is at least 0.1 to 0.4 mL/minute. Technetium 99m-labeled RBC scintigraphy (RBC scan), although sensitive, can identify only a general area of bleeding and is very limited in directing subsequent treatment. Patients with positive RBC scan results should be referred immediately to angiography for treatment. Results from studies of technetium-labeled RBC scintigraphy vary widely and may reflect differences in patient selection and timing of the study in relation to clinical presentation of bleeding. In 1 study of 103 patients with suspected small-bowel bleeding, scintigraphy failed to localize hemorrhage in 85% of cases. In pediatric patients and young adults, the Meckel scan is a useful test for overt small-bowel bleeding, with a sensitivity ranging between 62% and 87.5% for ectopic gastric mucosa.

Angiography also may be helpful in the evaluation of overt small-bowel bleeding if the bleeding rate is >0.5 mL/minute. Although technically less sensitive than nuclear scans, it is more effective at localizing the bleeding site, and immediate therapy can be undertaken if a bleeding source is identified. However, there are limited data on the diagnostic yield of angiography in small-bowel bleeding. Reported yields range from 20% to 77% in GI bleeding. Angiography carries the potential for therapy. Selective mesenteric embolization can be considered to reduce the risk of intestinal ischemia, which is a concern with embolization.

Specific therapy for small-bowel bleeding sources

Therapy for small-bowel bleeding depends on the etiology of the bleeding. Lesions found within the reach of a standard endoscope can be treated with appropriate therapy such as electrocautery, argon plasma coagulation, injection therapy, mechanical hemostasis (eg, hemoclips or bands), or a combination of these techniques. More distal vascular lesions, such as angiectasias, may be approached for therapy via push enteroscopy or DAE, depending on location. There is evidence that treatment has a positive impact on clinical outcome, by decreasing blood loss and the need for blood transfusions. Masses or tumors likely require surgical intervention, and management of massive bleeding should be coordinated with surgery and interventional radiology. After appropriate endoscopic and imaging studies, clinically stable patients with iron deficiency may be managed with iron therapy alone and followed clinically. Iron supplementation or blood transfusions may also be required in some patients with comorbidities and those who are not ideal candidates for repeat endoscopy.

Hormonal therapy for angiectasias largely has been abandoned because of lack of efficacy demonstrated in randomized controlled trials. Octreotide and low-dose thalidomide have shown some benefit in eliminating the need for blood transfusions and iron supplementation in patients with chronic blood loss from angiectasias and they can be considered for patients who are not candidates for endoscopic therapy or who continue to bleed after endoscopic therapy.

**Recommendations**

1. For patients with signs or symptoms consistent with recurrent upper or lower GI sources of bleeding, we suggest repeating EGD and colonoscopy, respectively, before small-bowel evaluation.

2. We suggest VCE as the initial test for patients with overt or occult small-bowel bleeding. Positive VCE results should be followed with push enteroscopy if within reach or DAE.

3. We suggest DAE or push enteroscopy if VCE is unavailable or nondiagnostic in patients with overt small-bowel bleeding.

4. We suggest that in select circumstances (eg, high level of suspicion of small-bowel angiectasias or in patients with surgically altered anatomy) DAE may be considered as the initial small-bowel diagnostic procedure in patients with small-bowel bleeding.

5. We suggest that after an appropriate negative evaluation, clinically stable patients without recurrent bleeding may be treated with iron therapy and clinically followed if iron deficiency is present.

6. We suggest multiphase CTE or MRE in patients with obscure bleeding and suspected small-bowel neoplasms.

7. Following appropriate hemodynamic resuscitation, we recommend angiography for selective embolization in patients who present with hemodynamically unstable suspected small-bowel bleeding.

8. We suggest a CTA or RBC scan for localization of the bleeding site and to guide timing of angiography in hemodynamically stable patients with suspected active small-bowel bleeding.
DISCLOSURES

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Abbreviations: ASGE, American Society for Gastrointestinal Endoscopy; BAE, balloon-assisted enteroscopy; CTA, CT angiogram; CTE, CT enterography; DAE, device-assisted enteroscopy; DBE, double-balloon enteroscopy; MRE, magnetic resonance enterography; NSAID, nonsteroidal anti-inflammatory drug; OGIB, obscure GI bleeding; RBC, red blood cell; VCE, video capsule endoscopy.

REFERENCES


52. Lara LF, Bloomfeld RS, Pineau BC. The rate of lesions found within reach of esophagogastroduodenoscopy during push enteroscopy depends on the type of obscure gastrointestinal bleeding. Endoscopy 2005;37:745-50.


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1. In patients with occult bleeding suspected to be from the small bowel who also have a high likelihood of IBD or tumor, the next diagnostic test should be
   a. Capsule endoscopy
   b. Spiral enteroscopy
   c. MRE or CTE
   d. Single balloon enteroscopy

2. Repeat bleeding rates after a negative capsule endoscopy study are about
   a. <5%
   b. 6% - 11%
   c. 15%-20%
   d. >25%

3. A patient returns for his second admission due to GI bleeding. He presents with melena and is hemodynamically stable. Prior evaluation including EGD, colonoscopy and capsule endoscopy was negative. The best initial test in this patient should be:
   a. CTE
   b. Capsule endoscopy
   c. Technetium 99m-labeled RBC scintigraphy
   d. Repeat EGD and colonoscopy
   e. Spiral enteroscopy

True or False

4. Hemodynamically unstable patients with GI bleeding, negative EGD and colonoscopy should undergo single balloon enteroscopy

5. Meckel scan has a sensitivity of 62% to 87% for localizing ectopic gastric mucosa

6. Technetium 99m-labeled RBC scintigraphy is very helpful in directing which endoscopic modality should be used to reach the bleeding area

7. Intraoperative enteroscopy is associated with high morbidity and is reserved for rare cases where device assisted enteroscopy cannot reach all bowel segments

8. Capsule endoscopy has a higher yield for lesions compared to push enteroscopy and double balloon endoscopy

9. CT enterography with IV contrast can be used to detect angiectasias and Dieulafoy’s lesions